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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/934,739	08/22/2001	Louis B. Rosenberg	IMM1P018B	9387

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EXAMINER

BELL, PAUL A

ART UNIT	PAPER NUMBER
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2675

DATE MAILED: 09/11/2002

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Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary

Application No.

09/934,739

Applicant(s)

ROSENBERG ET AL.

Examiner

PAUL A BELL

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 22 August 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 77-97 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 94-96 is/are allowed.
- 6) ☒ Claim(s) 77-82, 84, 86-93 and 97 is/are rejected.
- 7) ☒ Claim(s) 83 and 85 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

2. Claims 77, 86 and 97 are rejected under 35 U.S.C. 102(a) as being anticipated by Hiroo Iwata "Artificial Reality with Force-Feedback: Development of Desktop Virtual Space with Compact Master Manipulator," Computer Graphics, vol. 24, No. 4, 1990, pp. 165-170.

With regard to claim 77, Iwata teaches a computer readable medium including program instructions (figure 9) for simulating the spatial interaction of a displayed first simulated object (figure 4) with a displayed second simulated object (figures 11-13) in a computer-simulated spatial environment such that the user is provided with a force feedback that realistically represents said interaction (abstract), said program instructions performing the following on a computer system: executing a simulation including a first simulated object (figure 4), said simulation being configured to implement the motion of said first simulated object in response to motion of a physical object of an interface device controlled by a user (figure 5), wherein said physical object has a physical position in a physical work space, and wherein a position control mapping between said simulated location of said first simulated object and said physical position of said physical object exists (section 2.1), said simulation being further configured to generate a second simulated object having boundaries such that said second simulated object impedes the

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simulated motion of said first simulated object when the trajectory of said first simulated object intersects said boundaries of said second simulated object (sections 2.2 and 3.1); providing information causing a display device to display the location and motion of said first simulated object and said second simulated object such that when said first simulated object and second simulated object collide (section 3.2), the first simulated object is displayed at the boundary of the second simulated object as if unable to substantially penetrate said second simulated object , even if the motion of said physical object would indicate that a penetration should occur with respect to the position control mapping (figure 11); and providing information causing a force feedback mechanism (figure 8) to impart to a user of said force feedback mechanism a physical sensation that corresponds to the simulated physical interaction of said first simulated object with said second simulated object when the trajectory of said first simulated object intersects the boundaries of said second simulated object (figure 11).

With regard to claim 86 Iwata teaches a method for providing an interaction between displayed objects in a graphical environment (figures 11-13) implemented by a host computer (section 2-2 TITAN), wherein a user interfaces with said graphical environment using a force feedback device (figure 5) coupled (figure 1, RS-232C) to said host computer, the method comprising: moving a first graphical object (figure 4) in response to movement of a user manipulatable object of said force feedback device by said user, said movement of said first graphical object provided according to said movement of said user manipulatable object; determining whether said first graphical object has engaged a second graphical object (figures

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11-13) by examining a path of said First graphical object in said graphical environment, said path determined by examining a current location of said first graphical object and a previous location of said first graphical object (section 3-2); providing an illusion of rigidity of said second graphical object by displaying said first graphical object as remaining engaged with said second graphical object when said path of said first graphical object has been determined to move through said second graphical object according to said movement of said user manipulatable object (section 3-2 and figure 9); and providing information that causes said force feedback device coupled to said host computer to output an opposing force on said user manipulatable object by at least one actuator (figure 8) in said force feedback device in a direction approximately opposite to said path of said first graphical object while said first graphical object is engaged with said second graphical object (figure 8).

With regard to claim 97 Iwata teaches a method for providing an interaction between displayed objects in a graphical environment (figures 11-13) implemented by a host computer (figure 1, TITAN), wherein a user interfaces with said graphical environment using a tactile feedback device (figure 5) coupled (figure 1, RS-232C) to said host computer, the method comprising: moving a first graphical object (figure 4) in response to movement of a user manipulatable object of said force feedback device by said user (figure 5), said movement of said first graphical object provided according to said movement of said user manipulatable object (abstract); determining whether said first graphical object has collided with a second graphical object by examining a path of said first graphical object in said graphical environment (figure 9

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and section 3.2); providing an illusion of rigidity of said second graphical object by displaying said first graphical object as remaining engaged with the surface of said second graphical object when said path of said first graphical object has been determined to move through the surface of said second graphical object according to said movement of said user manipulatable object (section 3.2); and providing information that causes said tactile feedback device coupled to said host computer to output a sensation felt by said user, produced by at least one actuator in said tactile feedback device, corresponding with the displayed interaction between said first graphical object and said second graphical object (figure 8).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 78-82, 84 and 87 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iwata.

The main objective of the Iwata apparatus, is directed towards a force feedback interface device for use with a host computer displaying a graphical environment and this was shown to read on applicants claims above. The recitations with respect to the manner in which the

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apparatus is intended to be used does not necessarily differentiate the claimed apparatus from a prior art apparatus if the prior art apparatus teaches all the structural limitations of the claim.

Therefore the body of the apparatus claim which is directed towards, a computer readable medium including program instructions for simulating the spatial interaction of a displayed first simulated object with a displayed second simulated object in a computer - simulated spatial environment such that the user is provided with a force feedback that realistically represents said interaction, is not positively linked to the intended use or field of use recitations such as; a restoring force that is proportional, restoring force includes a spring force, restoring force includes a damping force, restoring force includes an inertial force, restoring force includes a component resulting from friction, and a restoring force includes a weighting factor and therefore these mere recitations of intended use or field of use are not given patentable weight.

Further it would have been obvious to one of ordinary skill in the art to use the Iwata apparatus as it was intended to be used such as “a restoring force includes a spring force” or any other well known and suitable use including those specified by the applicant because this prior art structure is capable of performing the intended use or field of use recitations. Also note Iwata in his APPLICATION AREAS section 4 states;

“Artificial reality is expected to be applied to various categories of human interface. Our application of the virtual space manipulation system is focused on two mayor fields of application of computer graphics: computer aided design and 3D animation.”

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This section provided the suggestion and motivation to use any well-known classical dynamic equation used to model reality known in the art of computer aided design and 3D animation with the force feedback apparatus of Iwata and for this reason applicants dependent stated recitations are viewed as intended use recitations. See *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963).

Allowable Subject Matter

5. Claims 83, 85, are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

6. Claims 94-96 are allowed.

7. The following is a statement of reasons for the indication of allowable subject matter:

The invention as claimed in each of applicant's independent claim 94 when considered as a whole, the exact arrangement of parts and/or the inter connections and functions, is not taught nor suggested by the prior art made of record. With regard to claim 94 the prior art does not teach or fairly suggest "providing information that causes said force feedback device coupled to said host computer to output (ii) a friction force on said user manipulatable object by at least one actuator in said force feedback device when said user manipulatable object is moved in a direction corresponding to a direction approximately perpendicular to said path of engagement of said first graphical object while said first and second graphical objects are engaged", in combination with all the other limitations of the claim.

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Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paul Bell whose telephone number is (703) 306-3019. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Saras, can be reached at (703) 305-9720.

Any response to this action should be mailed to: Commissioner of Patents and Trademarks
Washington, D.C. 20231
or faxed to: (703) 872-9314

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist). Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.

Paul Bell

Paul Bell

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29 August 2002

Don Chen
DENNIS-BOON CHEN
PATENT EXAMINER